A KEY TO THE ASIATIC GENERA OF THE *HESPERIIDÆ*.

By Capt. E. Y. Watson, Indian Staff Corps, f.e.s., f.z.s.

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In the Proceedings of the Zoological Society of London for 1893. page 3, there appeared a paper by me on a proposed arrangement of the genera of the *Hesperiidæ*, and Mr. de Nicéville has suggested to me that, for the convenience of workers in India, I should publish an excerpt of it as far as relates to Indian genera. In adopting his suggestion, I have considered it would render the paper more complete if all the Asiatic genera were included, as there are only sixteen of the latter at present described, which have not been recorded from within Indian limits, and it is quite probable that some of these will also be obtained hereafter within the Indian region.

I have found it necessary to alter, to a certain extent, the arrangement of my previous paper owing to several new genera having been recently described, and I have also found that, by slightly modifying the characters taken, it has been possible to arrange the genera more naturally. Having also seen specimens of the true *Isma obscurus*, or some species very closely allied to it, I now consider that I was wrong in assigning "*Isoteinon*" *cephala*, Hewitson, to the genus *Isma*, from the type species of which it differs markedly in the length of the antennæ. It does not, however, appear necessary to found a new genus for *cephala*, as it only appears to differ from *Zographetus* in wanting the male-mark characteristic of that species. It is therefore tentatively included in that genus, together with its close ally *cephaloides*, de Nicéville.

Since the publication of my paper above referred to, some nineteen new Asiatic genera have been described—sixteen* of them by Mr. de Nicéville, who has in every case kindly sent the types to me for examination to enable me to include them in the present paper; one, *Apostictopterus*, by Mr. Leech, in the "Butterflies from China, Japan, and Corea;" and two by Colonel Swinhoe in the Transactions of the Entomological Society of London for 1893, which are referred to below.

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* *Crossiura*, Journ. Bomb. Nat. Hist. Soc., vol. vii, p. 350 (1892).
Charmion, Ochus, Sepa, Journ. As. Soc. Beng., vol. lxiii, pt. ii, p. 48 (1894).
Suada, Ge, Itys, Idmon, Pudicitia, Mimas, Creteus, Zela, Zampa, Iton, Eetion, and *Acerbas* which are described in the paper which precedes this in the present Volume of this Journal.

Mr. de Nicéville has also cleared up some confusion which originally existed in the genera *Pisola* and *Capila*. As I had fallen into the same error as other workers with reference to these two genera, and had omitted to notice that the insect usually identified as the female of *C. jayadeva* was correctly the male of *P. zennara* and *vice versa*, the character on which I separated the two genera in the synopsis in my previous paper is quite valueless, as it simply separates the two sexes of one and the same species; it has therefore been found necessary to take a fresh character on which to separate the two genera.

The paper* by Colonel Swinhoe referred to above is an excellent example of the pitfalls and inconsistencies into which those fall who found Hesperid genera on male characteristics alone. In this paper Colonel Swinhoe erects two new genera—*Caltoris* and *Burara*—which differ from *Baoris* and *Ismene* respectively in certain male characteristics, but are otherwise identical with them. But, while describing these two genera, Colonel Swinhoe still leaves *stigmata* and *jhora* in the genus *Aëromachus* (presumably because even he had not the heart to separate two such intimate relations), and also retains the genus *Ismene* for the species *ataphus*, *jaina*, and *amara*, which differ from *œdipodea*, the type of *Ismene*, in the very important male character of not having the costal margin of the hindwing folded over, while the three species themselves differ, *inter se*, both in neuration and in the development of the sexual patch on the forewing, in which latter respect *amara* is certainly more distinct from *ataphus* than *vasutana* (the type of *Burara*) is from *amara*. The description of *Burara* is also very faulty, as, while Colonel Swinhoe notes the absence of the androconia on the forewing, he makes no mention of the folding over of the costa of the hindwing, thereby leaving it to be implied that in this detail *Burara* does not differ from *Ismene*, which is not the case.

So much for the inconsistencies, and now for the pitfalls. Under *Hasora vitta*,† Colonel Swinhoe states that that species can be readily distinguished from *Parata alexis* by "the entire absence of the very characteristic *subgeneric* sexual character of *Parata*, *i.e.*, an oblique

* It is doubtful if a paper so full of misprints and inaccuracies has ever been published by any scientific Society.

† This is probably an incorrect identification, the species meant being *Hasora chabrona*, Plötz.

glandular streak on the fore wings above." The next line reads "Genus *Parata*, Moore," but if *Parata* differs from *Hasora* only in an admittedly "subgeneric sexual character," why treat it as a distinct "genus." The same remarks, *mutatis mutandis*, apply to the re-erection of the "genus" *Pyrgus*, which differs (*teste* Swinhoe) from *Hesperia* in wanting the "sub-generic" character of a tuft of hair on the hind tibiæ. In this case, however, the pitfall is of greater depth, as, though Colonel Swinhoe is quite right in saying that *Pyrgus* and *Hesperia* differ as stated above, yet he has unfortunately overlooked the fact that the species *galba*, for which he re-erects the genus *Pyrgus*, differs from *syrichtus*, Fabricius, the type of *Pyrgus*, in the absence of the sub-generic sexual character of a costal fold on the forewing, so that, arguing on Swinhoean lines, the generic name *Pyrgus* is no more appropriate to *galba* than is the name *Hesperia*.

In this same paper Colonel Swinhoe describes eight new species of *Hesperiidæ* of only one of which mention will be found in the lists of species below, as I consider that the rest of them belong to species which have already been described and named. The eight species are *Isma isota*, *Caltoris onchisa*, *Halpe aucma*, *H. marta*, *H. wantona*, *H. perara*, *H. teliga*, and *Astictopterus kada*. What is described as *Isma isota* is simply the male of *Z. cephala*, which species differs sexually precisely in the points which Colonel Swinhoe has laid stress upon; *Z. cephala* was originally described from a female, and the type is in the Hewitson collection at the British Museum, while in the general collection at the same Museum there is a series of both sexes which Colonel Swinhoe apparently omitted to consult before describing his *I. isota*. "*Caltoris*" *onchisa* is an aberration of "*Caltoris*" *austeni*. I have seen the two specimens described, and can state with certainty that the "pale subapical fascia" on the forewing, which is the sole distinguishing character of *onchisa*, is not natural, but is the result of an accident either before or after capture, while the fascia is not of the same extent in both specimens; I suspected the nature of the fascia when I saw the specimens, and have since myself obtained a specimen of *Baoris conjuncta*, which has a precisely similar fascia; the marking is in all probability due to the insects having been stained by moisture while in their "papers." In the description the

apical fascia is said to be on the forewing, and in the note below on the hindwing; it is in reality on the forewing. *Halpe aucma*, *H. marta*, *H. wantona*, *H. perara* are without question merely slight forms of *H. homolea*, and it is incredible that any author could, from five specimens only, describe four "new species," which are admitted by the describer to be allied to such an exceedingly variable species as *H. homolea*. *H. teliga*, described from a single specimen, is a rather prominently-marked example of *H. moorei*, and is readily matched in any long series of that species. *Astictopterus kada* is probably what has been described by Mr. Moore as the female of his *Astictopterus olivascens*, specimens of which occur with one, two, or three subapical spots or with none at all ; however, since, as pointed out by Mr. Elwes, there appear to be two species confused under the one name *A. olivascens*, I have tentatively admitted Colonel Swinhoe's species, though I am by no means certain he has correctly discriminated it, as he makes no mention of having examined Mr. Moore's types so as to decide for which species his name should stand. As the species has an anal tuft which entirely conceals the sexual organs, so that it cannot be sexed without the last segment of the abdomen being denuded of scales and examined microscopically, Colonel Swinhoe's sexing must be accepted with reservation.

Colonel Swinhoe states in his introductory notes to the paper that he submitted all his new species to me for examination ; this is quite correct, except that I did not see specimens of *I. isota* or *A. kada*, but with reference to the other species, Colonel Swinhoe has omitted to mention that I told him I did not consider any of them to belong to undescribed species.

Mr. de Nicéville having sent me for examination a clearing of *batara*, the type of *Unkana*, I have seen from it that this species correctly belongs to the genus *Erionota*, and as *batara* was specified as the type of *Unkana*, that genus must sink as a synonym. Of the three other species placed under *Unkana* by Mr. Distant, *U. attina* is the female of *U. batara* and is the oldest name for the species, while for *U. elia* the genus *Eetion* has been described by Mr. de Nicéville.

In the present paper the genus *Parnara* has not been retained as distinct from *Baoris*. I previously kept these two distinct on a slight antennal character, but this has since proved to be more individual than

generic. The Indian species of the genus present three variations in their secondary sexual characters, viz., there is either a tuft on the upperside of the disc of the hindwing (*Baoris*), or an oblique discal stigma on the upperside of the forewing (*Chapra*), or, lastly, no secondary sexual character on the wings at all (*Parnara*). As far as the Indian species are concerned, these three groups can be kept as distinct subgenera, but when we come to African species, it is quite impossible to separate into natural subgenera species without a linear brand and those provided with it; in Africa also a fourth group occurs, which not only has a brand on the forewing, but also has a tuft on the hindwing, showing that these two characters are closely correlated.

The genera *Pithauria*, *Baoris*, and *Hasora* will be found below subdivided into subgenera on their secondary sexual characters, but these subdivisions, though useful for purposes of identification, are in many cases quite unnatural; for instance, *Hasora chromus* and *H. coulteri*, are certainly more nearly allied to *Parata simplicissima* and *Parata chromus* respectively than to each other or to any other *Hasora*, However, as the subdivisions of the above three genera have been made, it has been thought advisable to make reference to them, but I have not undertaken the responsibility of giving new names to the subgenera which might be formed in the genera *Carcharodus*, *Hesperia*, *Aëromachus*, *Zographetus*, *Padraona*, *Halpe*, *Iton*, and *Ismene*, as the advantages to be obtained by so doing would be very slight, and, with the exception of a small section of *Ismene*, none of the subdivisions have as yet been named by previous writers.

For detailed descriptions of the genera I must refer readers to my earlier paper already referred to, as in the present paper the genera are compared in the keys only on a single character, that taken being the one most readily recognisable. It must, however, be borne in mind that, though in many cases a male character is taken as distinctive of a genus, this is only done when the male character made use of is found to occur in *every described species* of the genus, and that the keys could, if necessary, be constructed on the female insect, but that then the characters taken would of necessity not be so readily recognisable.

The total number of genera dealt with as Asiatic is 90, of which 74 have been recorded from within Indian limits. This latter number will probably not be much increased hereafter, but there is no doubt that

many new genera remain to be described from the islands of the Malay Archipelago, and probably also from Southern China.

There are 27 species of *Hesperiidæ* described from India by various authors which I have not been able to identify with certainty, and which will not be found in the lists of species given below. These species are :—*Proteides lankæ*, Plötz, Ceylon, which is stated to be near (*Coladenia*) *indrani*, Moore ; *Hesperia taprobana*, Plötz, Ceylon, about the identity of which I can make no suggestion ; *Hesperia kolantus*, Plötz, India, which is a *Baoris* allied to or identical with *B. toona*, Moore ; *Hesperia saruna*, Plötz, India, which is a *Baoris* allied to, or identical with, *B. kumara* ; *Antigonus sezendis*, Plötz, Ceylon, which appears to be identical with *Sarangesa albicilia ; Apaustus discreta*, Plötz, India, which appears to be an *Aëromachus* possibly *A. jhora ; Hesperia vaika*, Plötz, India, which is perhaps a male of *Suastus gremius ; Apaustus sinhalus*, Plötz, Ceylon, which is almost certainly identical with *Suastus minutus* ; *Apaustus luteipalpis*, Plötz, Ceylon, which may be *Iambrix salsala ; Tagiades vulturna*, Plötz, Calcutta, which is apparently a true *Tagiades ; Tagiades cosima*, Plötz, N. India, which agrees with *Satarupa sambara ; Hesperia nala*, Plötz, India, which appears to be a *Padraona ; Plesioneura leucographa*, Plötz, which is apparently a *Notocrypta ; Hesperia alice*, Plötz, Mergui, which is near to *B. conjuncta* (=*narooa*) ; *Tagiades area*, Herrich-Schäffer, Bengal, which is a *Celœnorrhinus* near to *C. munda ; Telesto cœcilius*, Herrich-Schäffer, India, which appears to belong to *Telesto* or an allied genus, and is probably from the Australian region ; *Hesperia larika*, Pagenstecher, Ceylon, which appears to be similar to *Baoris* (*Chapra*) *mathias*, except that there are no spots in the discoidal cell of the forewing ; *Cyclopides lynx*, Möschler, Silhet, which appears to be a female *Ampittia maro ; Tagiades litigiosa*, Möschler, Silhet, which appears to be allied to, or identical with, *T. menaka ; Tagiades athos*, Weymer, Calcutta, which is close to *T. distans* and *T. obscurus ; Plesioneura varians*, Maasen, Southern Asia, and *Plesioneura chimœra*, Kelerst, India, both of which appear to belong to *Notocrypta ;* and *Plastingia egena*, Felder ; *Hesperia onara*, Butler ; *Telesto luteisquama*, Mabille ; *Telesto porus*, Mabille ; *Telesto disu*, Kollar, all described from the Indian region, besides which M. Mabille has described a few other

Hesperiidæ from India, but the names and descriptions are not now accessible to me ; of the above species, all or nearly all are certainly well known under other names.

All other species are ascribed to what are believed to be their correct genera, with the exception of "*Isoteinon*" *flavalum*, de Nicéville, no specimens of which are available for examination.

With the above-mentioned exceptions, it is believed that every species recorded from Indian limits is included in the lists of species below, excepting such as have been sunk as synonyms. Of the 230 species enumerated in "Hesperiidæ Indicæ," the following are omitted, having been wrongly included as from Indian limits : *Carcharodus marrubii*, *Kerana gemmifer*, *Halpe beturia*, *Hasora hadria* and *Ismene œdipodea ; Ampittia coras* has been since described as *Taractrocera nicevillei; G. litoralis* is sunk to *G. albofasciata*, *A. subtestaceus* and *A. khasianus* to *A. atkinsoni*, *A. nilgiriana* and *A. modesta* to *A. vindhiana*, *M. subfasciata* to *P. lebadea*, *C. consertus* to *C. asmara*, *C. munda* to *C. leucocera ; B. cingala* to *B. colaca ; B. farri* and *B. penicillatum* to *B. oceia*, "*Parnara*" *parca* to *C. cyrina*, and *S. subgrisea* to *S. gremius ;* while *O. sura*, *Z. flavipennis*, *N. alysos*, *H. sikkima*, *B. narooa*, *B. prominens*, and *S. subfasciatus* are shown under the older names *O. angulata*, *Z. ogygia*, *N. feisthamelii*, *H. homolea*, *B. conjuncta*, *B. sinensis*, and *S. pulligo* respectively. On the other hand *D. andamanica*, *I. stellifer*, and *B. bada* are separated from *D. bhagava*, *I. salsala*, and *B. guttatus* ; the following species described from outside the Indian region have been found to occur within it : *Charmion ficulnea*, *Celœnorrhinus aspersa*, *Tagiades dealbata*, *Odontoptilum pygela*, *Hesperia poggei*, *Pamphila gemmata*, *Suastus phiditia*, *Taractrocera ziclea*, *Pirdana hyela*, *Baoris brunnea*, *Lotongus calathus*, *Lotongus avesta*, *Isma submaculata*, *Acerbas anthea*, *Ismene etelka*, *Hasora chuza*, *Hasora chabrona*, and *Hasora simplicissima ;* and the following species either have been recently, or shortly will be, described from the Indian region : *Crossiura penicillatum*, *Sarangesa sati*, *Satarupa dohertyi*, *Caprona alida*, *Caprona elwesi*, *Hesperia geron*, *Carcharodus swinhoei*, *Ampittia maroides*, *Taractrocera atropunctata*, *Astictopterus kada*, *Koruthaialos hector*, *Suastus bipunctus*, *Suastus robsonii*, *Lophoides iapis*, *Notocrypta necœra*, *Halpe moorei*, *Halpe lyrie*, *Halpe fusca*, *Halpe astigmata*,

Halpe albipectus, *Onryza meiktila*, *Baoris philotas*, *Ismene ataphus*, and *Ismene fergusonii*, thus bringing the total number of species recorded from Indian limits to 257 (including "*Isoteinon*" *flavalum*).

Key to the sub-families of Asiatic HESPERIIDÆ.

A.—Sub-family HESPERIINÆ.—When in a state of complete repose the butterflies rest with their wings extended flat. The lower radial (vein 5) of the forewing arises nearer to the upper radial (vein 6) than to the third median branch (vein 4), the middle disco-cellular nervule being consequently shorter than the lower one. The male insect nearly invariably has a tuft of hair attached to the proximal end of the hind tibiæ, and occasionally has a costal fold on the forewing, but is never furnished with androconia on the upperside of the forewing.

B.—Sub-family PAMPHILINÆ.—When in a state of complete repose the butterflies rest with their wings perpendicularly closed over their backs. The lower radial of the forewing arises* nearer to the third median nervule than to the upper radial, the middle disco-cellular nervule being consequently longer than the lower one. The male insect frequently has patches of androconia of varying form on the upperside of the forewing, but never has either a costal fold on the forewing or a tuft* of hair on the hind tibiæ.

There seems no doubt that the above two sub-families represent two perfectly natural groups, as not only do they agree in neuration and habits, but a peculiar *facies* runs through each group, by which alone, with a little practice, the great majority of species can be readily assigned to their correct sub-family without the necessity of a minute examination of their neuration or a knowledge of their habits, though, of course, information on both these points should subsequently be obtained to confirm the correct position of any species.

Sub-family HESPERIINÆ.

In my above-quoted revision of the genera of the *Hesperiidæ*, it was found convenient to divide the present sub-family into two sections on a slight character of neuration, but, as nearly all the genera of the first section are confined to the New World, it has been thought more satisfactory to include all the Asiatic genera in one key.

* In some species of the third section of this sub-family, the lower radial is as in the *Hesperiinæ*, and there is a tuft on the hind tibiæ of the male, but in other respects this section is nearer to the *Pamphilinæ*, and its peculiar palpi serve to distinguish it from all the genera of the *Hesperiinæ*.

Key to the Asiatic Genera.

A. Radial of hindwing fully developed.

a. Male with a costal fold on forewing.

a^1. Hind tibiæ with terminal pair of spurs only.

CASYAPA, Kirby.

b^1. Hind tibiæ with both terminal and medial pairs of spurs.

*ORTHOPHŒTUS, nom. nov.

b. Male with no costal fold on forewing.

a^1. Male, inner margin of forewing longer than outer margin.

a^2. Cell of hindwing reaching up to or rather beyond middle of wing.

CALLIANA, Moore.

b^2. Cell of hindwing short, not reaching to middle of wing.

PISOLA, Moore.

b^1. Male, outer margin of forewing longer than inner margin.

a^2. Forewing apically produced, outer margin straight.

CAPILA, Moore.

b^2. Forewing not apically produced, outer margin convex.

CROSSIURA, de Nicéville.

B. Radial of hindwing wanting (*i.e.*, not fully developed into a tubular vein).

a. †Cell of forewing more than two-thirds the length of costa.

a^1. Male with a costal fold on forewing, and with no tuft of hair on hind tibiæ.

ACHALARUS, Scudder.

b^1. Male with no costal fold on forewing, but with a tuft of hair on hind tibiæ.

HANTANA, Moore.

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* I propose this generic name for *phanœus* and its allies, the name *Pteroxys* being preoccupied in *Heterocera*. *O. phanœus* is on the wing before sunrise.

† In measuring these distances, the length of the cell should be taken from the bifurcation of the median and subcostal nervures to the extreme apex of the cell, which in nearly every genus is at the origin of the fifth subcostal branch; the length of the costa should be taken in a straight line from the base of the costa, where it joins the thorax, to the extreme apex of the wing, which is situated practically at the extremity of the fourth subcostal branch. In referring above to the fifth subcostal branch, it would perhaps be more correct to say "terminal portion of subcostal nervure."

b. *Cell of forewing less than two-thirds the length of costa.

a^1. Antennæ, tip acuminate.

a^2. Terminal joint of palpi suberect.

a^3. Second median branch of forewing arising far before end of cell, hardly twice as far from base of wing as from end of cell.

CHARMION, de Nicéville.

b^3. Second median branch of forewing arising shortly before end of cell, more than three times as far from base of wing as from end of cell.

CELÆNORRHINUS, Hübner.

b^2. Terminal joint of palpi horizontally porrected.

a_3. Apex of forewing not truncate.

a^4. Lower margin of cell of forewing not strongly arched between first and second median branches.

a^5. Hindwing, outer margin sinuate.

a^6. Hindwing, hardly or not at all elongate; hind tibiæ of male with a tuft of hair attached to proximal end.

a^7. First subcostal branch of hindwing shorter than first median branch.

a^8. Lower margin of cell slightly arched between first and second median nervules.

SARANGESA, Moore.

b^8. Lower margin of cell straight between first and second median nervules.

COLADENIA, Moore.

b^7. First subcostal branch of hindwing as long as or longer than first median branch.

DAIMIO, Murray.

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* In measuring these distances, the length of the cell should be taken from the bifurcation of the median and subcostal nervures to the extreme apex of the cell, which in nearly every genus is at the origin of the fifth subcostal branch; the length of the costa should be taken in a straight line from the base of the costa, where it joins the thorax, to the extreme apex of the wing, which is situated practically at the extremity of the fourth subcostal branch. In referring above to the fifth subcostal branch, it would perhaps be more correct to say "terminal portion of subcostal nervure."

b^6. Hindwing, elongate; hind tibiæ of male densely fringed, but with no tuft of hair attached to proximal end.

SATARUPA, Moore.

b^5. Hindwing, outer margin even.

ODINA, Mabille.

c^5. Hindwing, outer margin very dentate.

DARPA, Moore.

b^4. Lower margin of cell of forewing strongly arched between first and second median branches.

TAGIADES, Hübner.

b^3. Apex of forewing broadly truncate.

a^4. Outer margin of hindwing angled at second median branch.

*TAPENA, Moore.

b^4. Outer margin of hindwing angled at third median and first subcostal branches.

CTENOPTILUM, de Nicéville.

b^1. Antennæ, tip blunt.

a^2. Male with a tuft of hair on fore coxæ.

a^3. Male with a recumbent tuft of hair on fore coxæ.

ODONTOPTILUM, de Nicéville.

b^3. Male with a radiating tuft of hair on fore coxæ.

CAPRONA, Wallengren.

b^2. Male with no tuft of hair on fore coxæ.

a^3. Outer margin of hindwing crenulated.

CARCHARODUS, Hübner.

b^3. Outer margin of hindwing even.

a^4. Antennal club straight.

GOMALIA, Moore.

b^4. Antennal club curved.

a^5. Club robust.

HESPERIA, Fabricius.

b^5. Club comparatively slender.

THANAOS, Boisduval.

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* In all the species of *Tapena*, with the exception of the type species *thwaitesi*, the truncation of the forewing is less conspicuous and the hindwing is squared, but not distinctly angled.

Species.—The following list comprises all the species of the subfamily *Hesperiinæ* which are known to occur within Indian limits :—

Orthophætus—
phanæus.
lidderdalei.
Calliana—
pieridoides.
Pisola—
zennara.
Capila—
jayadeva.
Crossiura—
penicillatum.
Achalarus—
liliana.
casyapa.
Hantana—
infernus.
Charmion—
ficulnea.
Celænorrhinus—
leucocera.
pulomaya.
flavocincta.
aspersa (= clitus).
pyrrha.
plagifera.
patula.
pero.
sumitra.
putra.
ambareesa.
chamunda.
nigricans.
fusca.
spilothyrus.
asmara.
cacus.
badia.
dhanada.
aurivittata.

Sarangesa—
purendra.
dasahara.
albicilia.
sati.
Coladenia—
dan.
fatih.
indrani.
tissa.
hamiltonii.
Daimio—
bhagava.
andamanica.
narada.
phisara.
Satarupa—
gopala.
sambara.
dohertyi.
Odina—
decorata.
hieroglyphica.
Darpa—
hanria.
Tagiades—
helferii.
ravi.
khasiana.
distans.
obscurus.
meetana.
alica.
menaka.
atticus.
gana.
dealbata.
pralaya.
trichoneura.
tabrica.
pinwillii.

Tapena—
thwaitesii.
agni.
laxmi.
buchananii.
Ctenoptilum—
vasava.
multiguttata.
Odontoptilum—
angulata.
pygela.
Caprona—
ransonettii.
saraya.
alida.
syrichthus.
elwesii.
Carcharodus—
dravira.
swinhoei.
Gomalia—
albofasciata.
Hesperia—
galba.
evanidus.
zebra.
geron.
poggei.
cashmiriensis.
Total 86 species.

Affinities.—The above arrangement will be found to be very fairly natural. The genera *Casyapa*, *Orthophætus*, *Calliana*, *Pisola*, *Capila*, and *Crossiura* are all very closely allied, in fact the differences

between the last four might be reasonably treated as only subgeneric, *Achalarus*, though closely allied to several North American genera, appears to have no nearer Asiatic ally than *Celœnorrhinus*; all the genera enumerated between *Hantana* and *Tagiades* are undoubtedly closely allied to one another; *Tapena* appears to be allied to *Tagiades*, *Celœnorrhinus* and *Ctenoptilum*; the last mentioned is closely allied to *Odontoptilum* and *Caprona*; while the last four genera are very close to one another, and also show relationship to *Achalarus* on the one hand and *Pamphila* on the other.

Range.—The genera *Casyapa* and *Thanaos* have not yet been recorded from within Indian limits: *Achalarus*, *Carcharodus* and *Thanaos* are almost entirely Arctic in their range; the first is found in North America as well as in Asia; *Carcharodus* is chiefly European, but also ranges to North Africa, while *Thanaos* is typically European, but species which have been assigned to it, though probably erroneously, are found in North America. Species of *Hesperia* occur throughout the whole of both Hemispheres with the exception of the Australasian region; it will probably, however, be found practicable hereafter to found new genera for many of the species which are now included under this genus. *Sarangesa*, *Coladenia*, *Tagiades*, *Caprona*, and *Gomalia* range to Africa; while species of *Celœnorrhinus* occur both in Africa and South America. The remaining genera are confined to the Asiatic region as far as present knowledge goes.

Sub-family Pamphilinæ.

The genera of this sub-family, being very numerous, are conveniently divided into three sections, of which the two first, founded on a slight difference in neuration, are purely artificial and are adopted only for convenience; the third section, however, consists of a group of closely allied genera, which appear to have no near allies among the other *Pamphilinæ*, so much so that it is questionable whether it would not be advantageous to form them into an additional sub-family under the name of *Ismeninæ*,* the species contained under which would stand in much the same relation to the remainder of the Old World *Hesperiidæ* that the *Pyrrhopyginæ* do to those of the New World.

* This name (but with a much more extended meaning) has been made use of by M. Mabille in a paper on the *Hesperiidæ* of the Brussels Museum published in the Annals of the Entomological Society of Belgium, vol. xxi (1878).

Section I.

Palpi various, but never as in Section III. Lower radial of forewing straight throughout its length and not arising markedly nearer to the third median branch than to the upper radial, the middle discocellular being therefore only slightly longer than the lower one.

Key to the Asiatic Genera.

A. Fore tibiæ without epiphysis, and hind tibiæ with terminal spurs only.

a. *Hindwing, second median branch immediately before end of cell, first median branch nearer to end of cell than to base of wing.

PAMPHILA, Fabricius.

b. *Hindwing, second median branch well before end of cell, first median branch nearer to base of wing than to end of cell.

HETEROPTERUS, Dumeril.

B. Fore tibiæ with epiphysis, and hind tibiæ with terminal and medial pairs of spurs.

a. First subcostal branch of forewing running very close to, or actually touching, costal nervure.

a^1. Terminal joint of palpi porrect, plainly visible.

a^2. First median branch of forewing nearer to end of cell than to base of wing.

BARACUS, Moore.

b^2. First median branch of forewing nearer to base of wing than to end of cell.

ASTICTOPTERUS, Felder.

†APOSTICTOPTERUS, Leech.

b^1. Terminal joint of palpi concealed in clothing of second joint.

SANCUS, de Nicéville.

c^1. Terminal joint of palpi erect, usually long, slender, and curving over vertex.

a^2. Forewing, second median about twice as far from first as from third ; hindwing, second median well before end of cell.

KORUTHAIALOS, Watson.

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* In my P. Z. S. paper referred to above, the forewing is given instead of the hindwing owing to an unfortunate oversight.

† In describing this genus Mr. Leech does not say how it differs from *Asictopterus* with which he says it agrees in neuration. The type species figured might from its appearance belong either to *Asictopterus* or *Sancus*.

b^2. Forewing, second median about four times as far from first as from third ; hindwing, second median almost at end of cell.

SUADA, de Nicéville.

b. First subcostal branch of forewing well separated from costal nervure throughout its entire length.

a^1. Terminal joint of palpi conspicuous, erect, long, slender, and curving over vertex.

a^2. Second median branch of forewing well before end of cell, and second median branch of hindwing from before end of cell.

SUASTUS, Moore.

b^2. Second median branch of forewing immediately before end of cell, and second median branch of hindwing from end of cell.

IAMBRIX, Watson.

b^1. Terminal joint of palpi inconspicuous, entirely or almost entirely concealed in clothing of second joint.

a^2. Antennæ very long, more than two-thirds length of costa of forewing.

GE, de Nicéville.

b^2. Antennæ of moderate length, less than two-thirds length of costa of forewing.

a^3. Terminal crook of antennæ short, or entirely absent.

a^4. First median branch of forewing considerably nearer to end of cell than to base of wing.

a^5. Second median branch of hindwing from before end of cell.

a^6. No tuft of hair on underside of forewing in male.

a^7. Club of antennæ forming a hollowed disc.

TARACTROCERA, Butler.

b^7. Club of antennæ elongated.

a^8. Costa of forewing strongly arched.

OCHUS, de Nicéville.

b^8. Costa of forewing straight. Forewing short and broad, apex squared, outer margin very convex.

* AMPITTIA, Moore.

c^8. Costa of forewing straight, apex acute, outer margin nearly straight.

AËROMACHUS, de Nicéville.

b^6. A tuft of hairs on underside of forewing in male.

SEBASTONYMA, Watson.

b^5. Second median branch of hindwing from end of cell.

PEDESTES, Watson.

b^4. First median branch of forewing not at all or only slightly nearer to end of cell than to base of wing, usually much nearer base of wing.

a^5. Male with no secondary sexual characters on upperside of forewing. Cilia at anal angle of hindwing much elongated.

LOPHOIDES, Watson.

b^5. Male with or without secondary sexual characters on upperside of forewing. Cilia at anal angle of hindwing normal.

a^6. Terminal joint of palpi erect.

a^7. Forewing apically produced in male; outer margin very oblique, almost equal in length to inner margin.

HYAROTIS, Moore.

b^7. Forewing not produced apically in male; outer margin hardly oblique, considerably shorter than inner margin.

ISOTEINON, Felder.

b^6. Terminal joint of palpi horizontal.

a^7. Terminal joint of palpi conspicuous.

a^8. Male with a short glandular streak lying along the submedian nervure on upperside of forewing.

IDMON, de Nicéville.

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* *A. maro*, Fabricius, the type of *Ampittia*, has no terminal crook to the antennæ; other species of the genus however have a minute terminal crook.

b^8. Male with no glandular streak on upperside of forewing.

ARNETTA, Watson.

b^7. Terminal joint of palpi concealed.

a^8. Hindwing, produced in submedian area; longer than broad; the submedian nervure practically equal in length to the length of the subcostal nervure from its origin to the extremity of its lower branch.

ITYS, de Nicéville.

b^8. Hindwing, produced in subcostal area; the submedian nervure much shorter than the subcostal nervure from its origin to the extremity of its lower branch.

a^9. Antennæ short, less than length of cell of forewing.

ZOGRAPHETUS, Watson.

b^9. Antennæ comparatively long, longer than length of cell of forewing.

ISMA, Distant.

b^3. Terminal crook of antennæ long, about twice as long as breadth of club.

a^4. Forewing, first median branch practically equidistant from end of cell and base of wing.

MATAPA, Moore.

b^4. Forewing, first median branch nearer base of wing, practically equidistant from base of wing and second median branch.

a^5. Hindwing, first and second median branches not swollen in the male.

a^6. Male with an oblique transverse discal stigma on upperside of forewing.

SEPA, de Nicéville.

b^6. Male with a short glandular streak lying along submedian nervure on upperside of forewing.

PUDICITIA, de Nicéville.

c^6. Male with no secondary sexual characters on upperside of forewing.

a^7. Second median branch of forewing considerably more than twice as far from first as from third.

ACERBAS, de Nicéville.

b^7. Second median branch of forewing hardly or less than twice as far from first as from third.

a^8. Hindwing normal, longer than broad.

* Zea, Distant.

b^8. Hindwing ample, broader than long.

Erionota, Mabille.

b^5. Hindwing, first and second median branches swollen in the male.

a^6. Forewing, apex truncate ; hindwing very broad.

Gangara, Moore.

b^6. Forewing, apex acute ; hindwing slightly elongate.

Paduka, Distant.

Affinities.—Of the above-named genera, *Pamphila* and *Heteropterus* are closely allied to one another and also apparently to *Hesperia* and the closing genera of the preceding sub-family; the want of the epiphysis on the fore tibiæ and of the medial spurs on the hind tibiæ readily distinguish them. *Baracus* appears to be allied to *Heteropterus* and also to *Astictopterus*. The succeeding genera as far as *Iambrix* connect with one another very naturally, and there seems little doubt as to their close relationship. The genus *Ge* is rather out of place, but is probably close to *Lophoides*; the next few genera, from *Taractrocera* to *Pedestes*, are all certainly closely allied to one another and also probably to *Pamphila* ; other near allies appear to be *Halpe* and *Padraona* which fall into the second section of the subfamily. The succeeding genera, as far as *Isma*, all appear to be closely allied to one another ; and the remaining genera, from *Matapa* to *Paduka*, also appear to be close allies and show relationship on the one hand with *Idmon* and on the other with *Kerana* and *Lotongus* and the other early genera of the succeeding group.

Range.—All the Asiatic genera of this group, with the exception of *Pamphila* and *Heteropterus*, are confined to the Asiatic region. Of

* Zea, Distant, Rhop. Malay., p. 377. Antennæ, moderate, club elongated, with a long terminal crook. Palpi, densely scaled, third joint almost entirely concealed. Legs, normal. No secondary sexual characters on wings or legs of male. Forewing, apex acute, outer margin straight, slightly longer than inner margin ; subcostals normal ; lower discoidal arising slightly nearer to the third median than to the upper discoidal nervule ; upper disco-cellular minute, middle one slightly longer than lower ; second median well before end of cell, less than twice as far from first as from third, first median about equidistant from second and base of wing. Hindwing, slightly elongate, with an inconspicuous lobe ; neuration normal, discoidal nervule not traceable, medians well separated. The above description is taken from a Sumatran male of *Z. mytheca*, Distant (the type of *Zea*), in the collection of Hofrath Dr. L. Martin, and lent to me for the purpose.

these two, the latter is European and the former is Holartic. No species of the genera *Heteropterus*, *Isoteinon*, *Ge*, *Idmon*, *Sepa*, *Zea*, or *Apostictopterus* have been recorded from within Indian limits. *Heteropterus* and *Isoteinon* are confined to Northern Asia. *Ge*, *Idmon*, *Zea*, and *Sepa* are at present only known from Malacca and Sumatra, and *Apostictopterus* contains a single species from China.

Species.—The following is a list of the species of this section which have been recorded from within Indian limits :—

Pamphila—
- avanti.
- gemmata.

Baracus—
- septentrionum.
- subditus.
- vittatus.

Astictopterus—
- olivascens.
- kada.

Sancus—
- pulligo.

Koruthaialos—
- hector.
- xanites.
- butleri.

Suada—
- swerga.

Suastus—
- gremius.
- sala.
- aditus.
- bipunctus.
- robsonii.
- minutus.
- phiditia.

Iambrix—
- salsala.
- stellifer.

Taractrocera—
- mævius.
- danna.
- ceramas.
- atropunctata.
- nicevillei.
- ziclea.

Ochus—
- subvittatus.

Ampittia—
- maro.
- maroides.

Aëromachus—
- stigmatus.
- jhora.
- kali.
- indistinctus.
- obsoletus.

Sebastonyma—
- dolopia.

Pedestes—
- masuriensis.
- pandita.

Lophoides—
- iapis.

Hyarotis—
- adrastus.

Arnetta—
- atkinsonii.
- vindhiana.

Itys—
- microstictum.

Zographetus—
- satwa.
- ogygia.
- indrasana.
- cephala.
- cephaloides.

Isma—
- submaculata.

Matapa—
- aria.
- druna.
- sasivarna.
- shalgrama.

Acerbas—
- anthea.

Pudicitia—
- pholus.

Erionota—
- thrax.
- acroleuca.
- attina.

Gangara—
- thyrsis.

Paduka—
- lebadea.

Total 60 species.

"*Isoteinon*" *flavalum*, de Nicéville, probably belongs to this section, but no specimens are available for examination.

SECTION II.

Palpi various, but never as in Section III. Lower radial nervure of forewing deflected downwards at origin and consequently arising much nearer to the third median branch than to the upper radial, the middle disco-cellular being therefore very much longer than the lower one.

Key to the Asiatic Genera.

A. Antennæ, tip acuminate.

a. Antennæ exceptionally long; terminal crook short, hardly longer than breadth of club.

a^1. Forewing, outer margin equal to, or shorter than, inner margin.

a^2. Second median branch of hindwing from well before end of cell.

KERANA, Distant.

b^2. Second median branch of hindwing from immediately before end of cell.

a^3. First median branch of hindwing almost equidistant from end of cell and base of wing.

ANCISTROIDES, Butler.

b^3. First median branch of hindwing more than twice as far from base of wing as from end of cell.

PIRDANA, Distant.

b^1. Forewing, outer margin considerably longer than inner margin.

PLASTINGIA, Butler.

b. Antennæ of moderate length; terminal crook long, about twice as long as breadth of club.

a^1. Male with no tuft of hair on fore coxæ.

a^2. Second median branch of forewing in male three times as far from first as from third.

a^3. Male with no secondary sexual characters.

LOTONGUS, Distant.

b^3. Male with first median branch of forewing swollen.

CRETEUS, de Nicéville.

c^3. Male with an oblique linear discal stigma on upperside of forewing.

ZELA, de Nicéville.

d^3. Male with a discal tuft on upperside of hindwing.

ZAMPA, de Nicéville.

b^2. Second median branch of forewing in male less than twice as far from first as from third.

a^3. Inner margin of forewing equal to outer margin.

MIMAS, de Nicéville.

b^3. Inner margin of forewing shorter than outer margin.

a^4. Hindwing broad, evenly rounded, no distinct anal lobe.

HIDARI, Distant.

b^4. Hindwing, elongate, with a distinct anal lobe.

EETION, de Nicéville.

b^1. Male with a tuft of hair at base of fore coxæ.

PITHAURIA, Moore.

Sub-genera { *a*. Male without discal stigma on upperside of forewing, *Pithauria*. *b*. Male with discal stigma on upperside of forewing, *Pithauriopsis*.

c. Antennæ of moderate length; terminal crook short, as long as, or slightly longer than, breadth of club.

a^1. First median branch of forewing considerably nearer to base of wing than to end of cell.

a^2. Male with no secondary sexual characters on wings.

a^3. First median branch of hindwing less than twice as far from base of wing as from end of cell.

a^4. Hindwing not produced in median area; distance from base of wing to extremity of third median branch less than distance from extremity of costal nervure to extremity of submedian.

NOTOCRYPTA, de Nicéville.

b^4. Hindwing produced in median area; distance from base of wing to extremity of third median branch considerably greater than distance from extremity of costal nervure to extremity of submedian.

UDASPES, Moore.

b^3. First median branch of hindwing twice as far from base of wing as from end of cell.

ACTINOR, Watson.

b^2. Male with two glandular streaks and a tuft of hair on underside of forewing.

GEHENNA, Watson.

c^2. Male with a circular glandular patch on hindwing at origin of second median branch.

CUPITHA, Moore.

d^2. Male with an oblique linear stigma on upperside of forewing.

AUGIADES, Hübner.

b^1. First median branch of forewing nearer to end of cell than to base of wing.

a^2. Terminal joint of palpi suberect, distinct.

a^3. Second median branch of forewing almost equidistant from first and third.

*TELICOTA, Moore.

b^3. Second median branch of forewing many times further from first than from third.

PADRAONA, Moore.

b^2. Terminal joint of palpi porrect, almost entirely concealed in clothing of second joint.

†a^3. Second median branch of forewing almost equidistant from first and third.

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* Male only, female almost as in *Padraona*.

† In those species of *Halpe* in which the males have a discal brand, the second median branch of the forewing is in that sex nearer to the first than to the third.

a^4. Second median branch of hindwing immediately before end of cell, much nearer the third than the first. Male with no tuft of hair on upperside of hindwing.

HALPE, Moore.

b^4. Second median branch of hindwing almost equidistant from first and third. Male with a tuft of hair on upperside of hindwing attached along costal nervure.

ONRYZA, Watson.

b^3. Second median branch of forewing much nearer to third than to first. Second median branch of hindwing almost equidistant from first and third.

a^4. Second median branch of forewing more than twice as far from first as from third. First subcostal branch of hindwing almost equidistant from costal vein and end of cell.

ITON, de Nicéville.

b^4. Second median branch of forewing hardly or less than twice as far from first as from third. First subcostal branch of hindwing very much nearer to end of cell than to costal vein.

*BAORIS, Moore.

Sub-genera:

a. Male with a tuft of hair on upperside of hindwing.

Sub-genus *Baoris*.

b. Male with a discal brand on upperside of forewing.

Sub-genus *Chapra*.

c. No secondary sexual characters on wings of male ; club of antennæ short and stout.

Sub-genus *Parnara*.

A fourth sub-genus of *Baoris* occurs in Africa, in which the males have both a discal stigma on the forewing and a tuft on disc of hindwing.

d. Antennæ short; terminal crook minute, never as long as breadth of club.

a^1. Antennæ very short, hardly longer than breadth of thorax.

GEGENES, Hübner.

b^1. Antennæ about twice as long as breadth of thorax, but less than half length of costa of forewing.

ERYNNIS, Schrank.

B. Antennæ, tip blunt.

ADOPÆA, Billberg.

AFFINITIES.—The arrangement of the genera in this section appears fairly natural, and connects satisfactorily with the last section; the genera from *Kerana* to *Eetion* all appear to be closely allied, and also show relationship to *Erionota*, *Sancus*, *Koruthaialos*, and *Astictopterus* of the preceding group; *Pithauria* is rather out of place, but appears to be close to *Hidari*, and is probably a near ally of *Baoris*; *Notocrypta* and *Udaspes* are certainly closely related to one another, but show no particular affinity to any other genera; *Actinor*, *Gehenna*, *Cupitha*, and *Onryza* appear to be allied to *Halpe*, which is itself close to *Iton* and *Baoris*; *Padraona* and *Telicota* are hardly generically distinct and are certainly close to *Augiades*, *Erynnis*, and *Adopœa*; while *Gegenes* appears to be allied to both *Baoris* and *Erynnis*.

RANGE.—All the Asiatic genera of this group are found within Indian limits with the exception of the following:—*Gehenna*, two species of which are known, one from Borneo and the other from Sumatra; *Ancistroides*, the two species of which are confined to the islands of the Malay Archipelago; *Zela*, *Zampa*, and *Eetion*, all of which are confined to Malaysia; *Mimas*, which is found in New Guinea; and *Adopœa*, which is Holarctic in its range. The following genera extend beyond Asiatic limits:—*Taractrocera* and *Telicota* to the Australasian region; *Ampittia*, *Baoris*, and *Baracus* to Africa; *Augiades* to Europe; *Gegenes* to Europe and Africa; *Padraona* to Australia and doubtfully to Madagascar and South America; while *Adopœa* and *Erynnis* are Holarctic.

SPECIES.—The following is a list of the species of this section which have been recorded from within Indian limits :—

Kerana—
diocles.
Pirdana—
rudolphii.
hyela.
Plastingia—
callineura.
noëmi.
margherita.
naga (?=tessellata).
Lotongus—
*sarala.
*avesta.
calathus.
Creteus—
cyrina.
Hidari—
irava.
bhawani.
Pithauria—
(*Pithauria*).
murdava.
stramineipennis.
(*Pithauriopsis*).
aitchisonii.
Notocrypta—
feisthamelii.
paralysos.
albifascia.
neæra.
restricta.
monteithii.
basiflava.
Udaspes—
folus.
Actinor—
radians.
Cupitha—
purreea.
Augiades—
siva.
brahma.
Telicota—
augias.
bambusæ.
Padraona—
dara.
mæsoides.
pseudomæsa.
palmarum.
gola.
goloides.
Halpe—
moorei.
ceylonica.
homolea.
separata.
kumara.
hyrie.
aina.
gupta.
fusca.
ornata.
cerata.
astigmata.
zema.
sitala.
brunnea.
albipectus.
masoni.
honorei.
decorata.
Onryza—
meiktila.
Iton—
semamora.
watsonii.
Baoris—
(*Baoris*).
oceia.
(*Parnara*).
cahira.
austeni.
kumara.
plebeia.
seriata.
pagana.
†conjuncta.
assamensis.
uma.
tulsi.
toona.
eltola.
canaraica.
bevani.
colaca.
philotas.
moolata.
bada.
guttatus.
flexilis.
(*Chapra*)—
†brunnea.
†sinensis.
agna.
subochracea.
mathias.
Gegenes—
nostrodamus.
karsana.
Erynnis—
dimila.

Total 87 species.

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* These species are nearest to *Lotongus*, but, when their males are discovered, may prove to be distinct.

† Mr. Leech has recently shown that *Baoris sinensis*, Mabille, is the oldest name for *Baoris prominens*, Moore. Mr. de Nicéville also informs me that *Baoris conjuncta*, Herrich-Schäffer, is an older name for *Baoris narooa*, Moore, and that *Chapra brunnea*, Snellen, is an older name for *C. cære*, de Nicéville.

Section III.

Third joint of palpi long, slender and naked, porrected horizontally in front of the face. Species robust. Habits often crepuscular.

Key to the Asiatic Genera.

A. Radial of hindwing well developed.

a. Second median nervule of hindwing immediately before end of cell.

a^1. Club of antenna longer than shaft.

Ismene, Swainson.

b^1. Shaft of antenna longer than club.

a^2. Submedian vein of forewing distorted downwards near its origin.

Hasora, Moore.

Sub-genera
- *a.* Male with no discal brand on upperside of forewing. Sub-genus *Hasora.*
- *b.* Male with a discal brand on upperside of forewing. Sub-genus *Parata.*

b^2. Submedian vein of forewing not distorted.

Bibasis, Moore.

b. Second median nervule of hindwing well before end of cell.

Badamia, Moore.

B. Radial of hindwing wanting.

Rhopalocampta, Wallengren.

Affinities.—This is a well-marked group of closely-allied genera which show no close relationship with any other genera of the *Hesperiidæ* ; their habits and general *facies* agree best with the genera contained in the subfamily *Pamphilinæ* ; their neuration, however, appears to have more resemblance to that found in the *Hesperiinæ* ; as suggested above, they might possibly with advantage be treated as a distinct sub-family.

Range.—This group of genera is confined to the Asiatic, African, and Australasian regions; *Ismene* and *Bibasis* have not been recorded out of Asiatic limits; *Hasora* is chiefly Malayan, and extends as far as Australia; *Badamia* also extends to the Australian region; *Rhopalocampta* is a very large genus, the species of which are almost entirely African, only two or three being found within Asiatic limits.

Species.—The following are all the described species of this group recorded from within Indian limits :—

Ismene—
- ataphus.
- jaina.
- etelka.
- fergusonii.
- amara.
- anadi.
- harisa.
- gomata.
- vasutana.
- mahintha.

Hasora—
(*Hasora*)—
- badra.
- anura.
- chabrona.
- coulteri.

(*Parata*)—
- chromus
- alexis.
- malayana.
- simplicissima.
- chuza.

Bibasis—
- sena.

Badamia—
- exclamationis.

Rhopalocampta—
- benjaminii.
- crawfurdii.

Total 23 species.